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abilities, was well-known for his devotion to scientific pursuits, and, during the last few years, his labors with those of his colleagues, Messrs. Everhart, Jeffries and Gray, have added many interesting species to the mycologic flora of Chester County.

The friends who were accustomed to accompany him in "fungus forays" through the grand old woods around West Chester will long cherish the recollection of those excursions among the pleasant memories of the past.

J. B. ELLIS.

### Botanical Notes.

*Coloring Matter of Flowers.*—H. Hansen has separated the two constituents of chlorophyll by Kühne's method. He has also examined the coloring matter of flowers. The yellow pigment is lipochrome and can be crystallized. It shows two bands in the blue and no fluorescence; that described by Pringsheim resulted from a small admixture of chlorophyll. The red coloring matter is in a state of solution in the cells. The spectrum shows a broad band between D. & b. The shades of red are often caused by an admixture of lipochrome, as in *Papaver*, *Lilium bulbiferum*, etc. The blue and violet pigments are also in a state of solution and show bands in the red half of the spectrum. Acted upon by acids, they become red. None of these pigments shows spectra resembling that of chlorophyll, except when a small quantity of that substance is present. (*Jour. Royal Micros. Soc.*)

**Proceedings of the Torrey Club.**—The regular meeting of the Club was held at Columbia College, Tuesday evening, Dec. 11th, 1883, the President in the chair and twenty-four persons present.

Messrs. Schrenk, Day and Britton were appointed a permanent committee to act with Mr. E. Steiger in preparing a catalogue of the plants of Central Park.

A permanent Committee, consisting of Messrs. Britton and Hyatt, and Miss Knight, was appointed to organize a sub-section for the study of physiological botany.

Dr. Willis showed specimens, from a dry hill near Scarsdale, N. Y., of a *Melanthium*, which Dr. Britton identified as *M. latifolium*. Desrouss, a species which grows on dry ground, while *M. Virginicum* occurs in swamps. One person was elected an active member.

According to previous announcement, the President, Dr. Newberry, was to have delivered an address upon the Vegetation along the Line of the Northern Pacific Railroad, but, owing to the lateness of the hour, he was obliged to confine himself to a description of the forest trees. The following is an abstract:

#### ON THE FOREST TREES OF THE COUNTRY BORDERING THE LINE OF THE NORTHERN PACIFIC RAILROAD.

In going westward from Lake Superior the arborescent vegetation ceases near Brainerd, the last trees being white pine, Banks's pine, the larch, white birch, white maple and aspen. Thence to the Rocky Mountains a continuous sheet of herbaceous vegetation

covers the surface, and no trees are seen except cottonwoods (*Populus monilifera*) along the Missouri. The first ranges of the Rocky Mountains on this route along the Yellowstone River and in the Park are covered sparsely or densely with trees, the higher summits and ridges with *Pinus flexilis*, James, *Abies grandis*, and *Tsuga Douglassii*, Carr., while the foot-hills, and, in some cases the levels, are thickly set with *Pinus contorta*, Dougl., var. *Murrayana*, Watson. This latter is regarded by some as a distinct species (*P. Murrayana*, Murr.), but is only an upland form, which is larger and more spreading. Both varieties, however, grow in proximity in many parts of Oregon and Northern California. In the lowlands of the Park are dense thickets of dwarf willow and here and there a tree of *Populus angustifolia*, James, and *Pinus ponderosa*, Dougl.

The divide west of Helena is covered with scattered trees of Douglass's spruce, which here reaches a height of one hundred feet. In the gorges which head in the mountains there are a few trees, often of good size, of *Pinus ponderosa*, Dougl., but they are here out of place and belong properly to the arid country between the Rocky Mountains and the Cascade Range.

In the valley of Clark's Fork and about Pend'Oreille Lake the forest growth is quite strong, the rocky cliffs and ridges are set with Douglass's and Menzie's spruces, while the lowlands sustain a crowded growth of slender trees belonging to three species which are characteristic of the Western flora, probably not crossing the divide. These are *Pinus monticola*, Dougl., *Larix occidentalis*, Nutt., and *Thuya gigantea*, Nutt. Of these, the first has altogether the habit of our white pine in trunk, foliage and branches, but is at once distinguished by its longer and more slender cones. In the Cascade Mountains this species occurs sparingly over a large area, but I have never seen it elsewhere in such abundance as on Clark's Fork. The same is true of the *Larix*; larger trees than any found here are scattered over the eastern slope of the mountains of Oregon, but they are comparatively rare. The *Thuya* extends from the sources to the mouth of the Columbia, constantly increasing in size; in the Rocky Mountains never attaining more than one-half the dimensions it reaches on the lower river. As we descend the valley of Clark's Fork the western hemlock (*Tsuga Mertensiana*, Carr.) begins to make its appearance; at first as shrubs or low trees simulating exactly the hemlock of the Eastern States, from which this has only a varietal difference. On the Lower Columbia it grows, like many other conifers, to be a majestic tree.

Between the last ranges of the Rocky Mountains, near Pend'Oreille Lake and the Cascades, the prevailing and almost the only tree is *Pinus ponderosa*, Dougl. It scarcely forms forests here, but is scattered over the country in considerable abundance and attains a large size.

Passing the gorge of the Columbia we come into the dense forests of the Pacific Coast proper, where the number and magnitude of the trees is greater than I have seen in any eastern or even tropical region. The trees of several kinds here reach an altitude of three hundred feet, and often stand so near together that all undergrowth is

absent, and the horseman makes his way through them with difficulty. On the lowlands the Douglass spruce and the western arbor vitæ are the most abundant. Locally, the hemlock is common, and along the rivers the Northwestern cottonwood (*Populus trichocarpa*, T. & G.) stands thick and attains a large size. Along the smaller streams, and in swampy places, the Oregon ash (*Fraxinus Oregana*, Nutt.) and the arborescent alder (*Alnus rhombifolia*, Nutt.) occur in considerable numbers and attain about equal size, *i. e.*, a diameter of one foot and a height of fifty or sixty feet. Scattered through this lowland forest are the two common maples of the West (*Acer macrophyllum*, Pursh, and *A. circinnatum*, Pursh.) Of these, the first grows sometimes to the height of eighty feet with a diameter of trunk of twelve to fifteen inches, and on young plants the leaves sometimes attain a breadth of a foot or more. The vine-maple is a peculiar feature in the forests of the Lower Columbia, Puget Sound and Vancouver's Island. It never becomes more than six inches in diameter and several trunks usually spring from the same root. These are very slender, droop, and, frequently reaching the ground, take root at the summit. Where these interlacing trunks are numerous they form a thicket which is almost impenetrable.

On the higher and more rocky portions of the country the Western balsam fir (*Abies grandis*, Lindl.) and its congeners *A. nobilis*, Lindl. and *A. amabilis*, Dougl., are locally numerous and attain great size, *i. e.*, reach a height of from one hundred and fifty to two hundred feet, and a trunk diameter of five to seven feet. With these, which form a distinct sub-genus, are the omnipresent Douglass spruce, and Menzies spruce, formerly known as *Abies Menziesii*, Dougl., but now generally called *A. Sitchensis*, Carr. Still higher, and reaching to the line of perpetual snow, are *Pinus flexilis*, James, var. *albicaulis*, and *Tsuga Pattoniana*, Englm., the latter the most beautiful of all conifers. Less common than the preceding conifers, but locally abundant in the country bordering the Lower Columbia and Puget Sound, are two cypresses (*Chamæcyparis Lawsoniana*, Parlat., and *C. Nutkaensis*, Spach.) Of these, the first, sometimes called the ginger pine, from the fragrance of its wood, is much admired and cultivated for its beauty and esteemed for the excellence of the lumber it furnishes. Scarcely less interesting to the botanist is the western yew (*Taxus brevifolia*, Nutt.), a tree often forty to sixty feet in height growing sparingly in the lower portions of Oregon and Washington. Three species of juniper are scattered over the dryer and more rocky parts of the country bordering the Columbia, viz., *Juniperus occidentalis*, Hook., in the foothills of the cascades, often an erect tree 40-50 feet in height; *J. Utahensis*, Englm., low and spreading, in the interior; and *J. communis*, L., generally distributed and closely resembling in foliage, fruit and mode of growth, the eastern and European plant.

Among the great conifers of the Pacific coast, two of the most gigantic and valuable, the sugar pine (*Pinus Lambertiana*, Dougl.) and the redwood (*Sequoia sempervirens*, Endl.) approach, and the first reaches the line of the N. P. Railroad, though their habitat is more southern, and both are important elements in the resources of the country from which it will derive much of its business. Of these,

the sugar pine—nearly related to the eastern white pine, by habit, foliage, cones and wood—is the monarch of the genus, frequently reaching a height of 300 feet, with a diameter of from 10 to 15 feet. This grows chiefly in the Sierra Nevada and Cascade Mountains throughout Oregon and California. The redwood is even larger. It is found only along the coast and about Port Orford forms forests, which surpass, in the average dimensions of the trees, any others I have seen. The lumber furnished by both these great trees is excellent; and, like the white pine of the East, they are suffering such wholesale destruction as promises soon to exhaust the supply they furnish. The next in intrinsic value as timber trees, and, from their abundance, having even greater economic importance, are the Douglas and Menzies spruces, the “white fir” (*Abies grandis*, Lindl.) and the western white cedar (*Thuja gigantea*, Nutt.) These form the basis of the lumber industry of the Puget Sound region and supply all the great saw-mills, some of which cut 250,000 feet per day. The timber furnished by these trees is good, but the lumber is inferior.

With the array of magnificent conifers which flourish in the moist and equable climate of the North Pacific coast, the poverty of the angiospermous flora is in striking contrast. Two maples, two poplars,—one on the high and other on low grounds—one ash and one alder have been enumerated. To these should be added two arborescent willows (*Salix lasiandra*, Benth., and *S. longifolia*, Muhl.) one oak of little value and two other hard-wood trees, and the list is complete. On the last mentioned trees I have made the following notes:

In the open grounds of the Willamette Valley, Puget Sound and Vancouver's Island, Garry's oak (*Quercus Garryana*, Dougl.) is not uncommon. It is usually of moderate size and of a peculiar straggling and misshapen growth; occasionally trees of three or four feet in diameter are met with, but the shape is so irregular and the wood so brittle that it has little value as a timber-tree. In the forests of both Oregon and Washington Territory two trees are sometimes seen that are sure to attract the attention of the eastern botanist. One of these which grows on the higher grounds, is the Oregon chinquapin (*Castanopsis chrysophylla*, A. DC.) generally a shrub, but sometimes reaching an altitude of fifty or sixty feet, and conspicuous from the golden pubescence of the under side of the leaf. The other tree to which I refer is the madroña (*Arbutus Menziesii*, Pursh.) This is a small tree, but one much admired; the foliage is persistent and rich, the leaves oblong or lanceolate with serrated edges, and the fruit, which grows in clusters, is red, and somewhat resembles that of the mountain ash, but is less abundant and grows in more open panicles.

**Note on Plate XLIII.**—Through an oversight on the part of the Editor the following sentence was omitted from the description of Plate XLIII., which appeared in our last number: “All the powers refer to the original drawings, which, in the plate, appear reduced to one-half their size.”